

Does Brand Management of Corporate Reputation Translate into Higher Market Value?

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Abstract

Brand associations affect image and one source of brand association is a company's reputation. While the relationship between a positive corporate reputation and operational performance is intuitively appealing, there has been relatively little empirical research. This study, using a comprehensive approach, seeks to empirically test the relationship and thereby determine whether firms with a positive brand image, that is those with a positive reputation, experience an economic benefit. Findings are that these firms are associated with a significant market value premium, superior financial performance, and lower cost of capital. Given these findings, marketing managers would do well to strive to build and maintain a positive reputation.

Does Brand Management of Corporate Reputation Translate into Higher Market Value?

Building a positive brand image is generally regarded as part of a company's overall marketing strategy. A brand can be a name associated with products and services offered by a company, or the brand can refer to the company name itself. Brand associations affect image and one source of brand association is a company's reputation. The brand name of a company not only indicates the type and quality of products and services offered, but also symbolizes the character of the company. Consumer perception about a brand can make or break a company. A positive brand image can boost consumer confidence in a company, affect decision-making, and build loyalty. Companies take great care in managing their brand image because it is an irreplaceable source of value.

A company's brand identity is affected not only by communications coming from the company itself, but also by factors in the marketplace. These factors can impact the consumer's perceptions by creating brand associations. Brand associations are anything linked to or connected with the brand name in a consumer's memory. In order to maintain a positive brand image, a company should strive to build and maintain its corporate reputation.

In describing the connection between a company's identity or reputation, and its brand, consider the following perspectives. A brand identifies the product or service offered by a company and differentiates them from the offerings of competitors. A basic definition of company reputation is provided by Fombrun (1996, 72): corporate reputation is "a perceptual representation of a company's past actions and future prospects that describe the firm's overall appeal to all its key constituents when compared to other leading rivals."

While there have been a number of normative studies on how to build a positive brand image or corporate reputation, the extent that such efforts pay off economically is not clearly

evident. The current study examines a fundamental issue of whether a corporation that attains a positive brand image also experiences superior financial performance. While the connection between superior image and superior financial performance is intuitively appealing, there have been relatively few empirical research studies regarding this linkage. If there were evidence for the linkage, this would provide significant motivation to marketing management and overall corporate management to develop and maintain a corporate reputation-building strategy.

As a result of corporate scandals at the beginning of the millennium, the importance of a positive corporate image has never been greater. When a business firm loses its reputation, there is a loss of trust, which is fundamental to business activities involving the firm's customers, suppliers, lenders, investors, and others. A positive corporate reputation connotes management's commitment to fair and principled business practices. A key factor in corporate reputation is corporate social responsibility, such as ethical marketing practices and taking care of the environment. Other factors include wise use of assets, financial soundness, and investment value, all of which are based on good corporate governance.

This study will update prior research and offer a definitive, more comprehensive analysis than previously undertaken regarding the economic effects of corporate image. This study has two research objectives: (1) To investigate whether firms with a positive brand image have higher market values and (2) To explore the nature of any market-value premium, that is, whether the market premiums of these firms arise from superior financial performance (i.e. greater profitability and efficiency), or from lower cost of capital (lower risk), or both.

This study provides an important incremental addition to the research literature by investigating whether a market-value premium is associated with corporate brand image. This study compares firms with a positive brand image to a sample of control firms, matched by size

and industry. The findings indicate that positive-image firms benefit from an average market value premium of \$1.3 billion. In addition, results indicate that these firms experience superior financial performance and a lower cost of capital (lower risk). Firms with a positive brand image are more profitable on several dimensions such as industry-adjusted return on sales and return on assets. These firms have lower risk, as they experience less volatility in sales and net income, have less likelihood of bankruptcy, and have lower stock price volatility. The benefits associated with a positive branding provide an incentive for marketing managers to engage in behaviors leading to or maintaining a positive corporate reputation, which in turn will enhance brand image.

PRIOR RESEARCH AND MOTIVATION FOR THE STUDY

Brand image and corporate reputation have been discussed by writers in business professional journals and by academic scholars in the research literature. Research related to corporate reputation crosses disciplines, and concerns not just marketing and financial performance but also falls under the broad umbrella of corporate governance. For example, Schlegelmilch and Pollach (2005) examine the issue of communicating corporate ethics. Hemphill (2006) studies the connection between social reputation and board fiduciary responsibility. Dowling (2001) provides evidence that a good corporate reputation can lead to a company achieving greater profitability than rivals in the same industry. He purports that a positive corporate reputation engenders a potent set of strategic benefits. Similarly, Neville et al. (2005) identify relationships among corporate reputation, stakeholders, social performance and financial performance.

Mukherjee and He (2008) put forth a model for examining effects of reputation on competitive advantage by unveiling a "black box" of how company identity, as perceived by

three key company stakeholders (senior managers, employees, and customers) forms a central evaluation of the company by those stakeholders, thereby affecting their cognitive, interpretive, and behavioral consequences. These consequences foster the company's ability to attain and maintain superior performance.

A corporation's reputation to its stakeholders results in brand associations that connote beliefs, moods, emotions, and general evaluations held by stakeholders regarding the corporation (Mukherjee and He 2008, Dacin and Brown 2006, Brown and Dacin 1997). Normative research examines how a corporation's reputation can be structured so as to maximize brand valuation and to nurture a socially responsible corporate identity. Mukherjee and He (2008) conclude that the importance of company reputation to brand equity cannot be overstated. They examine processes of how brand identity affects stakeholders' attitudes and behaviors that are beneficial to corporate performance. Suh and Amine (2007) state that multinational corporation CEOs need to envision a synthesis of numerous fields of activity within their companies in order to achieve the types and levels of integration that are desirable for effective reputation management.

Traditional financial theories pertaining to the efficient markets suggest that a strong brand image would not be useful to estimating future market valuation or deriving a current market-value premium, as information regarding reputation would already be taken into account by the markets (Dimand and Ben-El-Mechaiekh 2005, Cunningham 1994). If so, then managers would not expect that improving or maintaining a positive brand image or corporate reputation would lead to a market-value premium for the company.

Contrary to the above, opinions that reputation matters, are plentiful, perhaps most exemplified by Warren Buffet's successful investment approach (Buffet and Clark 2002): Seek out excellent (i.e., positive reputation) businesses that are undervalued and hold them for the

long-term. By doing so, Buffet has achieved abnormally high returns on investments due to a market-value premium accruing to those strong brands. Theoretical support for a business building its brand equity is provided by impression management theory (Carter 2006).

Impression management theory suggests that businesses direct reputation management activities towards their stakeholders, in order to receive tangible economic and other benefits. In this study, we argue that one of these benefits is a market value premium, which benefits the corporation by improving the wealth of its stockholders.

In addition to impression management theory, there are other theoretical supports why a corporation seeks a positive brand image. For example, agency theory and Posner's signaling theory indicate that managers might seek or maintain a positive corporate reputation, if this results in economic benefits for the company (cf., Martí and Balboa 2003, Padilla 2003, Posner 2000). Basdeo et al. (2006) draw on signaling theory to find that reputation is influenced both by a firm's own actions and by its rivals' actions. In addition, Riahi-Belkaoui (2003) examines the role of reputation to explain relative market value for multinational firms. He finds that internalization theory supports higher valuation when a company has a positive brand image. According to Roberts and Dowling (2002), current strategy theory indicates that superior branding results from advantages possessed by a firm in relation to its competitors; in their study, results indicate that firms with superior branding are better able to maintain superior profitability over time.

Other past research studies pertaining to corporate reputation include Becchetti et al. (2007), Desai et al. (2007), Barnett et al. (2006), Chun (2005), Chalmers and Godfrey (2004), Sacconi (2004), Cox et al. (2004), Harrington (2003), Weaver et al. (1999a, 1999b), Cohen

(1995), Fombrun and Shanley (1990), Keim (1978), and Carroll (1973). A brief review of these studies is provided below.

The issue of corporate reputation and brand image, as it is built on various characteristics (e.g. ethical marketing practices, environmental responsibility, good human resources practices, and honest financial reporting), is increasingly important to corporate business practices in countries around the world. Reputation has become more important in recent years, following Enron and other financial scandals, resulting investor losses, and ruined reputations of involved companies. According to Becchetti et al. (2007), there has been very little empirical research on its impact and relevance in the capital market. Desai et al. (2007) identified reputational penalties to top corporate managers at firms that violate financial reporting standards. As a result of these reputational penalties, there was higher management turnover and poorer employment prospects for the displaced managers.

Barnett et al. (2006) indicate that the concept of corporate reputation has gained importance in recent years. Their research reviews, analyzes, and evaluates prior definitional statements of corporate reputation. Chun (2005) observes that the interest in corporate reputation encompasses a wide range of academic disciplines. She develops a construct for evaluating corporate reputation. Chalmers and Godfrey (2004) find that discretionary reporting, with regard to derivatives, is positively related to the magnitude of reputation costs confronting managers and firms. Sacconi (2004) offers a definition of corporate social responsibility (CSR) in terms of an economic theory of self-regulation based on the concepts of social contract, reputation and reciprocal conformism. Cox et al. (2004) examine institutional investor preferences for reputation built on corporate social performance. Their research found that long-term

institutional investment was positively related to social performance. Findings by Cox et al. support earlier studies by Johnson and Greening (1999) and Graves and Waddock (1994).

Harrington (2003) points out that as far back as the 1960s, socially conscious investors joined together to promote stocks of companies with a reputation for not polluting, good employment practices, and not exploiting the third world. Following Enron and other financial scandals in the early 2000s, both socially responsible investors and profit-oriented investors have found some common ground, as both are evaluating a company's social conscience. Harrington concludes that unethical companies drain shareholder value. Taking steps to build a reputation based on social responsibility was once regarded as harmful to financial performance. According to Harrington, there is evidence this is no longer the case. From 1990 to 1998, the Domini 400 Social Index, which measures the impact of social screening on financial performance, returned 18.54 %, which exceeded the S&P 500 return of 16.95 % (Harrington 2003). Becchetti et al. (2007) used the Domini 400 Social Index to evaluate the market reaction to corporate entry and exit from the Index, a benchmark for reputation built on corporate social responsibility.

Weaver et al. (1999a) evaluate why corporations establish formal programs to manage ethics. Control theory is used to delineate the scope and orientation of ethics programs. Also discussed are research and policy implications. Weaver et al. (1999b) examined corporate responses to expectations for socially responsible behaviors. Analysis of survey and archival data were used, leading to implications for social performance research, practice, and public policy. Earlier, Cohen (1995) develops a conceptual framework for studying moral climate. She suggests key themes from organizational climate theory for describing and diagnosing moral climate. Herremans et al. (1993) examine the relationship of corporate social responsibility reputation and

economic performance. Fombrun and Shanley (1990) consider management strategies for building corporate reputations.

Related to reputation, Keim (1978) and Carroll (1973) offer foundational work on the study of social responsibility. Keim (1978) observed that the constraints within which business operates are changing. Carroll (1973) noted that the social environment would require adoption of more contemporary and encompassing definitions regarding corporate efficiency and productivity. Subsequent years have proved out the expectations of these earlier works.

A number of research studies have focused on the list of 'Most Admired Companies' featured annually in *Fortune* magazine. The Most Admired list is widely regarded as the penultimate measure of corporate reputation (Fisher 2007). A few representative studies concerning the Most Admired list include: Anderson and Smith (2006), Damodaran (2003), and Antunovich and Laster (1999).

Anderson and Smith (2006) examine stock performance of the companies on Fortune's Most Admired list. They found that a portfolio of these stocks outperformed the market by a substantial and statistically significant margin. This was unexpected, as they anticipated that a company's well-known virtues are already incorporated into the price of the company's stock.

Damodaran (2003) observes that conventional wisdom suggests that an investor should buy stocks of companies with a positive brand image and good management, and the investment returns will come. This is a message oft repeated by investment experts such as Warren Buffet (2007). This is only logical, as a well-run company should be worth more than a poorly run company. Yet, this is not a simple matter, as the investor must determine what the well-run companies are and whether they are priced appropriately to provide an above-average return on

investment. Damodaran' (2003) research considers different dimensions of excellence such as financial results and corporate social responsibility.

Antunovich and Laster (1999) examine the challenge that investors face in selecting investments that have high brand awareness, but which may or may not be good investments. They evaluate the relationship between corporate reputation (based on Fortune's Most Admired List) and investment attractiveness. They answer the question whether investing in high-reputation companies, regardless of the price, is a sound idea. Their results indicate that the most admired firms are good investments and that their stock prices were not bid up too high.

The current study will attempt to build on the prior literature by offering a unique analysis of brand image, using a modified Ohlson (1995) model to determine if companies with a positive brand image (i.e., highly admired) enjoy a market-value premium. Further, the current study will examine whether this market-value premium, if it exists, results from financial performance or lower risk, or both. The results will provide a current and unique analysis of the value of brand image, which will provide important implications for corporate managers.

RESEARCH QUESTIONS

The first research question is stated as follows: Do firms with a positive brand image have higher market value? Positive brand image is proposed to be a value-relevant intangible asset, specifically, a "structural asset" as described by Lev (2001). Used as a proxy for positive brand image is a publicly available measure, namely, inclusion on the list of "America's Most Admired Companies" published annually by *Fortune* magazine. The Most Admired list includes 582 firms (Fortune 2005). These firms will be matched to a sample of control firms (matched on size and industry). Using a modified Ohlson (1995) model, cross-sectional tests (comparing list

firms to their control firms) will be used to determine if firms with a positive brand image enjoy a market-value premium.

Prior studies have examined the economic consequences of individual firm attributes associated with reputation-related factors, such as ethical behavior (McAnally et al. 2006), firm reputation and corporate governance characteristics (Fukami et al. 1997), customer satisfaction ratings (Ittner and Larcker 1998), workplace quality (Ballou et al. 2003), and firm environmental reputation (Clarkson et al. 2007, 2004). Results of the current study will show whether firms with a positive brand image have higher market value than control firms, after accounting for concurrent financial performance, macro-economic conditions, and other documented value-relevant intangible assets (Hand 2002, Amir et al. 2003). Therefore, the first hypothesis is stated as follows:

Hypothesis 1: Firms with a positive brand image have higher market value of equity.

The second research question is as follows: If a market value premium exists, is the premium related to superior financial performance (i.e. greater profitability and efficiency), or to a lower cost of capital (lower risk) or both? To answer this research question, two hypotheses are stated as follows:

Hypothesis 2: Firms with a positive brand image have superior financial performance.

Hypothesis 3: Firms with a positive brand image are less risky.

To test Hypothesis 2, that firms with a positive brand image have superior financial performance, calculations will be made of a number of accounting-based performance measures (e.g. ROA) and test the statistical difference between mean and median measures for list and control firms. To test Hypothesis 3, that firms with a positive brand image are less risky, we use

several common accounting-based and market-based risk measures (e.g. liquidity: current ratio and leverage: long-term debt to assets) are evaluated.

DATA AND METHODOLOGY

For testing our hypotheses, we use an external measure to identify firms with a positive brand image, namely the list of America's Most Admired Companies, published annually by *Fortune* magazine. Use of Fortune's list of most admired companies has been the subject of various criticisms, principally due to the fact that past financial performance is one of the determinants of reputation (Eberl and Schwaiger 2005, Roberts and Dowling 2002, Bromley 1993, Sobol et al. 1992, Fombrun and Shanley 1990, Fryxell and Wang 1994, Brown and Perry 1994). Nevertheless, past financial performance is legitimately a major influence on the reputational perceptions of stockholders, analysts, lenders, and other stakeholders. Despite criticisms of Fortune's list over the years, no one has yet created a universally accepted measure of brand image or corporate reputation. Furthermore, given that past financial performance is a reputational factor, the Fortune list is arguably as good as any list, and it certainly is the most widely known and has the advantage of being externally prepared (not the creation of an academic researcher investigating reputation).

Each year, the March issue of *Fortune* magazine identifies "America's Most Admired Companies." These are touted as firms that have outperformed their peers in the hierarchy of American business. The magazine staff along with survey partner, Hay Group (2007), a firm specializing in global human resources and organizational consulting, acquires ratings of corporate excellence for the 1,000 largest U.S. companies (ranked by revenue) and the 25 largest U.S. subsidiaries of foreign-owned companies.

Ratings are obtained from several thousand top executives, outside directors, and securities analysts. These experts were asked to rate firms in their own industry or economic sector, comparing firms to competitors with respect to eight key attributes: quality of products or services, innovation, ability to attract and retain talented employees, quality of management, social responsibility, wise use of assets, financial soundness, and investment value. Determining the meaning of the attributes within a specific industry is left to the respondents. A score is calculated for each firm and the firms are ranked according to their score in 65 industries. Each year, firms are normally selected for inclusion on the list based on firm practices and data available during the preceding two years.

Our sample begins with 582 firms on the *Fortune's* 23rd annual *Most Admired* list (Fortune 2005). Using Compustat data (year, total assets and three-digit SIC code), we matched each firm to a firm not on the *Fortune's Most Admired* list (hereafter referred to as 'control firms'). Because *Fortune* publishes their *Most Admired* list in March each year, the data used to compile the list is taken from the financial statements available during the prior year. For example, *Fortune* compiled its 2005 list during the prior year using the most current data available at that time. We identified control firms consistent with the *Fortune* methodology and were able to match 542 firms.

We gathered Compustat and CRSP data for all our list and control firms from 2002 to 2004. We are primarily interested in whether firms with a positive brand image have a higher market value of equity and not whether the higher score per se increases market value. Thus, we include in our sample the list firms and the control firms for the entire three-year period.¹ We use the following modified Ohlson (1995) model as our primary test of Hypothesis 1:

¹ The 2005 list was available at the time we began this study but 2005 financial and market data were not. Thus our terminal year is 2004. Because our empirical models require some lagged data, our final time-series is three years—

$$MVE_{i,t} = ASSETS_{i,t} + LIABS_{i,t} + AB_EARN_{i,t} + BRAND_i + CONTROLS_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $MVE_{i,t}$ is the market value of company i 's equity at the end of year t ; $ASSETS$ and $LIABS$ are the book value of total assets and liabilities respectively; AB_EARN is abnormal earnings measured as actual earnings for year t less a 10 percent charge for the cost of equity capital.² $BRAND_i$ is an indicator variable set equal to '1' if the firm is on the *Fortune's Most Admired* list for 2005 and zero otherwise. A positive coefficient on $BRAND_i$ will provide evidence that the market assigns a market premium to firms with a positive brand image. $CONTROLS$ is a vector of control variables, some of which are discrete indicator variables. To control for macro-economic conditions that affect the market value of equity, we include year indicator variables (where the earliest year in the time-series is omitted). We also control for other types of intangible assets (apart from the intangible created by brand equity building behavior) that may increase firm value (Kallapur and Kwan 2004, Hand 2002, Lev 2001, Ghosh 2000). In particular, we include the following variables: MKT_SHARE , a proxy for market dominance (calculated as annual sales scaled by cumulative sales in the firm's four-digit SIC industry group), and $INDUSTRY$, a proxy for other industry-specific structural assets (a vector of binary indicator variables based on the firm's two-digit SIC code).

Amir et al. (2003) argue that readers cannot always gauge the value of intangible assets solely from the financial statements. Further, signaling perceptions of brand image and reputation is often problematic for business firms. While investors may value reputable behavior, financial statements and annual reports may not be able to reliably convey a firm's position in

2002 through 2004. This period is arbitrary so we also conducted our statistical tests on the four years covered by the Most Admired list and none of our results are qualitatively different.

² Abarbanell and Bernard (2000) report consistent results for abnormal earnings calculated with discount rates ranging from nine to 15 percent. Their calculations hold rates constant across time and firms. As a robustness test, we also calculate abnormal earnings using rates from 8 percent to 12 percent and our findings are qualitatively unchanged.

the eyes of the consumer. This suggests that an external signal of brand image, such as inclusion on the *Most Admired* list, could provide value-relevant information to the market. If the overall score assigned to firms in the *Most Admired* list provides a value-relevant signal, firms with higher scores should have larger market value than firms with relatively lower scores. To test this we estimate the following model on the list firms only:

$$MVE_{i,t} = ASSETS_{i,t} + LIABS_{i,t} + AB_EARN_{i,t} + SCORE_{i,t} + CONTROLS_{i,t} + \varepsilon_{i,t} \quad (2)$$

where $SCORE_{i,t}$ is the overall score (ranging from 2.18 to 9.36) for the listed firms obtained from *Most Admired* list. In this specification, listed firms are compared from each other, which allows us to test whether the overall score itself is a value-relevant signal to the market.

To address Hypothesis 2, that firms with a positive brand image have superior financial performance, we calculate a number of accounting-based performance measures and test the statistical difference between mean and median measures for list and control firms. Our tests include measures of profitability, growth, and efficiency. In particular, our profitability measures are sales divided by total assets, cost of sales margin (cost of sales divided by sales), return on total assets (net income divided by total assets), and return on equity (net income divided by total equity). Our growth measures are year-over-year changes in sales, cost of sales margin and net income. Our efficiency variables include inventory turnover (cost of sales divided by ending inventory), accounts receivable turnover (sales divided by ending accounting receivable), and accounts payable turnover (cost of sales divided by ending accounts payable).

To address potential concerns that our matched sample may miss important financial characteristics that actually explain a market premium to reputable firms, we create an annual industry benchmark for each performance measure above. Thus, the industry benchmark is a second, broader test of Hypothesis 2. Using the methodology in Fama and French (1997) to identify industry membership, we define the industry benchmark as the median of each

performance measure calculated using all firms in the industry for which Compustat data are available that year. Then, we subtract each industry benchmark from the firm's performance measure. Thus, our industry-adjusted variables measure how much the list firm's performance differs from all other firms in their industry. If list firms have superior performance, their mean industry-adjusted variables will be significantly different from zero and in the hypothesized direction. For example, we expect that the industry-adjusted mean ROA (net income/average total assets) will be significantly positive (negative) for list firms.

To address Hypothesis 3, that firms with a positive brand image are less risky, we evaluate several common accounting-based and market-based risk measures. While it is difficult to accurately measure a firm's riskiness or cost of capital with any one metric (Easton 2003), collectively our risk measures provide a composite picture of firms' overall riskiness. We evaluate balance-sheet measures of liquidity (current ratio) and leverage (long-term debt to assets) as well as a credit score measured as follows (Altman 2000):

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + X_5 \quad (4)$$

where X_1 is working capital to total assets, X_2 is retained earnings to total assets, X_3 is earnings before interest and taxes to total assets, X_4 is total equity to total debt, and X_5 is sales to total assets. This ratio is commonly used to predict bankruptcy and cost of debt issuances (Grice and Ingram 2001).

We also estimate risk metrics that consider the volatility of firms' operations (Froot *et al* 1993). In particular, we measure the riskiness of income statement and cash flow measures as the standard deviation of the prior eight quarters' sales, operating income and cash from operations. Because standard deviation is not scale-free, we first scale each performance measure by assets and then calculate the standard deviation of the resulting scaled variables.

Finally, we assess two market-based risk measures estimated using monthly CRSP returns over the preceding two years. These risk metrics are the stock price volatility defined as the standard deviation of the monthly logged price relatives (Grinblatt and Titman 2002) and the Fama-French (1997) three-factor systematic market beta calculated as the sum of $(\beta_{m,t} + \beta_{m,t-1})$ estimated from the following model:

$$r_{i,t} - r_{f,t} = \alpha + \beta_{m,t}(r_{m,t} - r_{f,t}) + \beta_{m,t-1}(r_{m,t-1} - r_{f,t-1}) + \beta_{s,t}(\pi_{s,t}) + \beta_{s,t-1}(\pi_{s,t-1}) + \beta_{v,t}(\pi_{v,t}) + \beta_{v,t-1}(\pi_{v,t-1}) \quad (5)$$

where $r_{i,t}$ is the firm's stock return during month t , $r_{f,t}$ is the risk-free rate, $r_{m,t}$ is the value-weighted market return for month t , $\pi_{s,t}$ is the excess return for firm size during month t , and $\pi_{v,t}$ is the excess return for financial distress (i.e. market to book value) during month t .

Consistent with our performance measures, we also calculate industry-adjusted risk measures except for our market betas. These measures are regression coefficients, which already account for the 'mean' effect by market and size segment.

ANALYSIS AND RESULTS

Sample description

Table 1, Panel A shows the industry membership of our sample firms (as reported in 2003). Sample firms represent a broad cross-section of firms with the largest proportion in the industrial machinery and financial services industries.

Place Table 1 about here

Table 1, Panel B reports descriptive statistics and compares the list and control firms. Recall that to create the list published in March of any given year, Hay Group compiles information about the firm from the annual report two years prior. Thus, the time lag between

Hay analysis and list-publication is between 15 and 21 months. For parity with the Hay methodology, panel B includes data from the annual report from two years (i.e., 2003) prior to the firm's inclusion on the list (i.e., 2005). Consistent with our matching on total assets, mean assets do not differ significantly across the list and control firms. However, the median list firm is somewhat larger than its match. As well, mean and median market value of equity is significantly greater for the list firms despite the fact that total assets are statistically equal. On average, list firms have higher market share: 25.12 percent for list firms compared with 14.94 percent of control firms. In addition, list firms have higher return on assets providing initial evidence about superior performance of reputable firms. Percentage of loss firms and return on equity are statistically indistinguishable.

Tests of Hypothesis 1

Table 2 presents regression results for Model 1. We estimate this model for each of the 582 list firms and the control firms from 2002 through 2004. Consistent with prior research that uses the Ohlson (1995) model, the coefficients on *ASSETS* and *LIABS* are strongly positive and negative respectively, and both exceed unity (in absolute value). The coefficient on abnormal earnings is 1.41., which is in the range published in prior studies that use the Ohlson model (1995, 1999). The coefficient on *BRAND* is significantly positive (1,342.93, $p < 0.02$), which we interpret as list firms enjoying an average market premium of about \$ 1.3 billion (our dependent measure, market value of equity, is measured in millions). The control variables that capture other types of intangible assets (*MKT_SHARE*) are also significant consistent with prior work on the value-relevance of intangibles (Kallapur and Kwan, 2004). Given that we control for these other intangible assets, we conclude that reputable firm behavior creates a valuable intangible asset that is distinct from their industry peers.

Place Table 2 about here

A potential criticism of our Model 1 specification is that our matched firms provide a less-than perfect control condition. Thus, we estimate models for a sample that includes only list firms from 2002 to 2004. This time-series design regress market value of list firms on the overall reputation score (*SCORE*) assigned by Fortune magazine. Recall that the range of the score is from 2.18 to 9.36. The benefit of estimating the market value of equity model this way is that it allows us to abstract away from firm-specific differences between the list firms and the matched control firms. Moreover, this design permits us to test the construct validity of the *Most Admired* list itself. That is, we can directly test whether the overall scores assigned to each list firm provides a value-relevant signal.

Table 3 reports regression results for Model 2. Consistent with Model 1 results, the variables in Model 2 have coefficients of the predicted signs. In particular, the coefficient on *SCORE* is strongly positive (2,615.24, $p < 0.001$), indicating for each reputation point increase firms can increase their market value by 2.6 billion dollars.

Place Table 3 about here

Taken together our regression results provide strong evidence that firms with a positive brand image are more valuable to stockholders. Next we explore whether these firms have superior past financial performance (that predicts superior future performance), whether they are less risky, or both.

Tests of Hypothesis 2

To test Hypothesis 2 that the list firms outperform other firms, we compare the means and medians for three important dimensions of performance: profitability, growth, and operational efficiency. Table 4 reports the mean and median performance measures for list and control firms for 2002 through 2004. We use t-tests (Wilcoxon signed-rank tests) to compare the mean (median) performance measures across the two groups. A t-test is used to assess whether the median-adjusted performance measures (i.e. each firm's performance measure less its industry benchmarks) is statistically different from zero. Table 4 shows that list firms are more profitable than control firms. List firms have higher industry-adjusted sales to total assets, return on assets, and return on equity.

Place Table 4 about here

Contrary to our expectation that reputable firms may enjoy internally generated cost savings, we find that list firms' cost of sales (as a percentage of sales) is slightly higher than for the control firms (0.68 for list firms versus 0.66 for control firms). We find that list firms exhibit stronger growth in sales and operating income. These indicate the list firms manage market expansion, presumably by engaging in more positive relations with customers, better than firms not on the list. Again, contrary to what we expected, list firms' cost of sales margin grew slightly faster than that of control firms. A potential explanation is that reputable firms price their products (services) lower than industry competitors to gain and/or retain their market share. Lastly, list firms exhibit more operational efficiency; accounts receivable turnover is better than the industry benchmark and better than the control firms. Interestingly, list firms seem to settle

their accounts payable more quickly than control firms (25.7 days compared to 32.7 for control firms). One interpretation is that reputable firms engender trust and continued good relations with suppliers by promptly paying their bills.

Industry-adjusted variables (reported in the last two columns of Table 4) show that most of the performance characteristics have means and/or medians that exceed zero statistically (except cost of sales margin, which is negative as expected). Thus, list firms' financial performance is better than the average firm in their respective industries. This provides additional evidence in support of Hypothesis 2.

Tests of Hypothesis 3

To test Hypothesis 3 that the list firms are less risky than the control firms, we compare mean risk measures of the list firms to the control firms as well as to the industry benchmarks. These measures are shown in Table 5. First, we consider the balance sheet risk metrics. Compared to the control firms, list firms have a lower current ratio (1.612 compared to 1.853). In addition, list firms have lower current ratio than their industry benchmarks (mean industry-adjusted current ratio is -0.027). Thus, we conclude that list firms are less liquid. One potential explanation is that they maintain lower levels of current assets because of their operational efficiencies (documented in Table 4). List firms are less levered on average—mean and median long-term debt to assets is lower for list firms. Altman Z-scores, which represent a composite risk measure, are significantly greater for list firms (3.441 compared to 2.958). Firms with higher Altman Z-scores are predicted to have less likelihood of bankruptcy. Thus, our balance-sheet risk measures together indicate that list firms are less risky than non-list firms but the evidence is mixed.

Place Table 5 about here

Second, we compare the volatility of sales, earnings, and cash flows and find that list firms experience less volatility than control firms in sales and net income (median only for net income), which we interpret as list firms being less risky, consistent with Froot *et al* (1993). All of the industry-adjusted variables indicate that list firms experience less volatility. Thus, we conclude that list firms exhibit more stable operating results as measured by income statement and cash flow numbers.

Lastly, we compare market-based risk metrics. List firms have lower stock-price volatility than control firms as well as lower Fama-French three-factor betas. Thus, both total market risk and systematic risk are lower for reputable firms as compared to peer firms.

While each of the risk measures reported in Table 5 alone would be insufficient to unequivocally conclude that the list firms are less risky, collectively they present strong evidence that list firms are less risky than the average firm in their respective industries as well as less risky than a matched sample of firms. Taken together our results support our third hypothesis.

Our cross-sectional regression results (Model 1) show that firms with a positive brand image have higher market value of equity after controlling for current performance and other value-relevant intangible assets suggested by prior research. In addition, our time-series regression results (Model 2) suggest that the overall score assigned by *Fortune* captures a value-relevant dimension. Our univariate tests show that list firms have superior financial performance and that this manifests in greater profitability, growth, and operating efficiency. Lastly, tests of various risk measures suggest list firms are less risky.

Additional tests

Waddock and Graves (1997) present evidence consistent with social and financial performance being jointly determined. In addition, Brown and Perry (1994) suggest that there exists a financial performance halo in *Fortune's* index of firm reputation due to the importance of financial information, such as accounting profitability and risk, to the magazine's ranking. That is, it could be that firms that perform better financially are perceived as more trustworthy and having a more positive brand image ex ante, but do not perform better ex post. To shed some light on this issue, we examine financial performance and risk measures after a firm's inclusion on the *Most Admired* list.

Table 6 reports the sample medians for our profitability, growth, and efficiency variables calculated for one quarter after the firm is included on the *America's Most Admired* list.³ Each variable reported in Table 6 represents the firm-specific difference between the list firm and its industry benchmark, as measured by annual industry median. Positive measures therefore imply that the list firm outperformed the average firm in the industry that year. This design is more rigorous than a t-test of means, because it accounts for industry specific changes in performance that controls for performance being a leading indicator of a positive brand image (as Damodaran 2003 suggests). The table confirms that list firms continue to outperform their industry peers in the quarter following the match. Taken together, our evidence suggests that reputable firms have superior performance in both the short and longer run.

Place Table 6 about here

³ These tests examine medians as opposed to means because our sample includes a few extremely influential observations that skew the mean and impede our understanding of overall trends.

SUMMARY AND CONCLUSIONS

One source of brand association is a company's reputation. In order to maintain a positive brand image, a company should also maintain a positive company reputation. A good reputation is dependent on ethical behavior related to factors such as marketing strategies, treatment of employees, care of the environment, and honest financial reporting. The contribution of the current study is to ascertain whether there are economic effects associated with a positive brand image and a good corporate reputation. The current study offers the most comprehensive effort to date, by including an analysis to determine if a market value premium is associated with firms that have a positive brand image, and an evaluation of whether the market value premium, if it exists, is derived from superior financial performance or lower risk.

Regarding Research Question 1, whether firms with a positive brand image have higher market value, the results indicate that indeed these firms do enjoy a market value premium. Firms with a positive brand image show an average market value premium of \$1.3 billion. We conclude that reputable firm behavior creates a valuable intangible asset that is distinct from industry peers. Therefore, results support impression management theory, in that those businesses, which can effectively direct reputation management activities, will receive tangible economic and other benefits, in this case, an increase in the wealth of the corporate stockholders. These results complement earlier work that shows the positive benefits associated with a positive brand image and corporate reputation (e.g. Anderson and Smith 2006, Cox et al. 2004, Harrington 2003, Roberts and Dowling 2002, etc.).

Regarding Research Question 2 addresses whether a market-value premium of firms with a positive brand image, if such premium exists, is related to superior financial performance (i.e. greater profitability and efficiency), or from a lower cost of capital (lower risk), or both. Results

indicate that these firms experience superior financial performance and a lower cost of capital (lower risk). Firms with a positive brand image are more profitable on several dimensions such as industry-adjusted sales to total assets and return on assets. These firms have lower risk, as they experience less volatility in sales and net income, have less likelihood of bankruptcy, and have lower stock price volatility. Marketing managers would do well to consider the benefits associated with a positive brand image, as an incentive for engaging in ethically responsible behavior leading to or maintaining a positive image.

Findings of this study make an important incremental contribution to the research literature on branding and corporate reputation, by identifying a specific economic benefit, a market value premium, associated with firms that possess positive brand images. Further, this study shows that this market-value premium is derived from superior financial performance and lower cost of capital. Future research might address other economic benefits or possibly non-economic benefits. For example, other benefits might include impact on specific marketing strategies, the company's image in the local community, the ability to create working relationships with other companies, and the ability to attract and retain superior employees.

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TABLE 1
Demographics and descriptive statistics of financial variables for firms on Fortune's
American's Most Admired list in 2005 and the sample of control firms

Panel A: Industry representation for sample firms

Industry description	Two-digit SIC	Percent of sample
Oil and gas extraction	13	2.21%
Building construction general contractors and builders	15	1.77%
Food and kindred products	20	4.33%
Furniture and fixture	25	1.77%
Paper and allied products	26	2.12%
Printing, publishing, and allied industries	27	2.39%
Chemicals and allied products	28	4.59%
Petroleum refining and related industries	29	1.77%
Primary metal industries	33	1.59%
Fabricated metal products	34	1.41%
Industrial and commercial machinery	35	5.48%
Electronic equipment and components	36	2.98%
Transportation equipment	37	3.89%
Measuring, analyzing, and controlling instruments	38	3.00%
Motor freight transportation and warehousing	42	1.94%
Transportation by air	45	2.03%
Communications	48	3.00%
Electric, gas and sanitary services	49	4.24%
Wholesale trade-durable goods	50	3.62%
Wholesale trade – nondurable goods	51	2.83%
General merchandise stores	53	1.94%
Food stores	54	1.59%
Apparel and miscellaneous retail	56 & 59	4.74%
Depository institutions	60	4.42%
Other non-depository financial services	61-63	7.16%
Business services	73	5.30%
Other	various	8.44%

TABLE 1 (continued)

Panel B: Means, medians and lower and upper quartile statistics for sample firms

	582 List firm years				552 Control firm years			
	Mean	Lower quartile	Median	Upper quartile	Mean	Lower quartile	Median	Upper quartile
Total assets	37,656.23	1,731.80	7,295.34	24,405.00	26,835.10	1423.00	4634.96	18020.01
Return on assets (ROA)	4.22%*	1.29%	3.74%	7.12%	2.00%	0.53%	2.50%	5.64%
Return on Equity (ROE)	22.39%	1.50%	15.60%	27.29%	29.78%	-0.28%	11.49%	23.18%
Percent of firms with loss	8.39%	N.A.	N.A.	N.A.	9.54%	N.A.	N.A.	N.A.
Total sales	14,771.72*	2,744.37	6,057.50	15,119.00	9515.13	1123.52	2999.59	8897.00
Book value of equity	6,521.23*	840.00	2,270.00	6,320.00	4,242.00	533.46	1483.43	4353.46
Market value of equity	18,149.22*	2,152.96	6,029.91	16,075.79	9,129.30	894.99	2868.065	7,290.28
Market share	25.12%*	5.85%	13.11%	35.29%	14.93%	3.00%	8.06%	16.22%
Abnormal earnings	575.47*	1.33	145.24	601.94	280.20	-32.55	44.25	266.43

Notes to Table 1:

The table reports the means, lower quartile, median and upper quartile separately for 582 firms on the *Most Admired* list for 2005 with some observations leaving the sample due to missing data and 552 control firms matched on asset size and industry for each of the following variables:

Total assets (Compustat #6), in millions of dollars.

Return on assets = Net income (Compustat #172) / Common equity (Compustat #11), in percent.

Return on assets = Net income (Compustat #172) / Total assets (Compustat #6), in percent.

Percent of firms with loss = 1 if Net income (Compustat #172) is negative; zero otherwise.

Total sales (Compustat #12), in millions of dollars.

Book value of equity = Total assets (Compustat #6) – Total liabilities (Compustat # 181), in millions of dollars.

Market value of equity = Price per share (Compustat # 199) × Shares outstanding (Compustat # 25), in millions of dollars.

Market share = Total sales (Compustat #12) / \sum Total sales (Compustat #12) for all firms in four digit SIC code, in millions of dollars.

* Mean for list firms is significantly different than mean for control firms at $p = 0.05$ or better using a one-tailed student t-test.

TABLE 2
Ordinary least-squares regressions of market value of equity models

Model 1:

$$MVE_{i,t} = ASSETS_{i,t} + LIABS_{i,t} + AB_EARN_{i,t} + BRAND_i + MKT_SHARE_{i,t} + Year_i + Industry_j + \varepsilon_{i,t}$$

		Complete time-series 2002 to 2004 N=2,580 ^a	
	Pred Sign	Parameter estimate	student t- statistic
<i>Intercept</i>		-986.66	-0.32
<i>ASSETS</i>	+	2.58	68.87*
<i>LIABS</i>	–	-2.62	-66.06*
<i>ABNORM_EARN</i>	+	1.41	13.13*
<i>BRAND</i>	+	1342.93	2.32*
<i>MKT_SHARE</i>	+	49.23	3.33*
<i>Year</i>	+/-	Suppressed	
<i>Industry</i>	+/-	Suppressed	
Adj-R ²		80%	

Notes to Table 2:

^a This regression includes time-series observations from 2002 through 2004 for the 582 unique firms on the *Most Admired* list for 2005 and 552 control firms matched on asset size and industry membership (with some firm-year observations leaving the sample due to missing data).

Variable definitions (measured at fiscal year end):

MVE, market value of equity = Price per share (Compustat # 199) × Shares outstanding (Compustat # 25), in millions of dollars.

ASSETS, total assets (Compustat #6), in millions of dollars.

LIABS, total liabilities (Compustat #181), in millions of dollars.

BRAND, indicator variable = 1 if firm is on the America's Most Admired Companies list in 2005, 0 otherwise

ABNORM_EARN, abnormal earnings = Net income (Compustat #172) – 0.10 × prior year's equity (Compustat #11), in millions of dollars.

MKT_SHARE, market share = Total sales (Compustat #12) / ∑ Total sales (Compustat #12) for all firms in four-digit SIC code, in percent.

Year, year indicator variable = 1 if observation is from that year, and 0 otherwise.

Industry, industry indicator variable = 1 if firm is in two-digit SIC code, and 0 otherwise.

* Co-efficient is significantly different than zero at p = 0.05 or better using a two-tailed student t-test.

TABLE 3
Ordinary least-squares regressions of market value of equity models

Model 2:

$$MVE_{i,t} = ASSETS_{i,t} + LIABS_{i,t} + AB_EARN_{i,t} + SCORE_i + MKT_SHARE_{i,t} + Year_t + Industry_j + \varepsilon_{i,t}$$

Model 2 (N=1,516) ^a			
	Pred Sign	Parameter estimate	student t-statistic
<i>Intercept</i>		-17,561.00	-3.43*
<i>ASSETS</i>	+	2.53	50.61*
<i>LIABS</i>	–	-2.57	-48.14*
<i>ABNORM_EARN</i>	+	1.21	9.17*
<i>SCORE</i>	+	2615.24	5.43*
<i>MKT_SHARE</i>	+	63.24	2.87*
<i>Year</i>	+/-	Suppressed	
<i>Industry</i>	+/-	Suppressed	
Adj-R ²		81.07%	

Notes to Table 3:

^a These regressions includes time-series observations from 2002 through 2004 for the 582 unique firms on the *Most Admired* list for 2005 (with some firm-year observations leaving the sample due to missing data).

Variable definitions (measured at fiscal year end):

MVE, Market value of equity = Price per share (Compustat # 199) × Shares outstanding (Compustat # 25), in millions of dollars.

ASSETS, total assets (Compustat #6), in millions of dollars.

LIABS, total liabilities (Compustat #181), in millions of dollars.

ABNORM_EARN, abnormal earnings = Net income (Compustat #172) – 0.10 × prior year's equity (Compustat #11), in millions of dollars.

SCORE, overall score assigned to *America's Most Admired Companies* by Fortune magazine.

MKT_SHARE, Market share = Total sales (Compustat #12) / ∑ Total sales (Compustat #12) for all firms in four-digit SIC code, in percent.

Year, year indicator variable = 1 if observation is from that year, and 0 otherwise.

Industry, industry indicator variable = 1 if firm is in two-digit SIC code, and 0 otherwise.

* Co-efficient is significantly different than zero at p = 0.05 or better using a one-tailed student t-test.

TABLE 4
Descriptive statistics for profitability, growth and efficiency measures

	List firms^a unadjusted variables		Control firms^b unadjusted variables		List firms^a industry-adjusted variables	
	Mean	Median	Mean	Median	Mean	Median
Profitability variables						
Sales to total assets	1.322*	1.007*	1.052	0.893	0.044†	0.028†
Cost of sales margin	0.680	0.721	0.660	0.707	-0.014†	-0.001†
Return on assets	0.035*	0.043*	0.030	0.037	0.023 †	0.012†
Return on equity	0.070*	0.152*	0.242	0.122	0.071	0.039†
Growth variables						
Sales	2.227*	0.100	0.187	0.000	21.232†	0.043
Cost of sales margin	0.118*	0.001*	0.042	0.000	0.049	-0.004†
Net income	-0.999	0.050*	0.434	0.000	1.731	0.144†
Efficiency variables						
Inventory turnover	19.399*	7.808*	32.121	7.696	13.141†	0.178†
Acc. receivable turnover	20.214*	7.788*	13.470	6.620	2.786†	0.035
Acc. payable turnover	14.047*	9.093*	11.118	8.187	1.665†	0.107†

Notes to Table 4:

^a This column includes 582 firms on the *Most Admired* list for 2002-2004 with some firm-year observations leaving the sample due to missing data.

^b This column includes 552 control firm (matched on asset size and industry membership with 582 firms on the *Most Admired* list for 2002-2004 with some firm-year observations leaving the sample due to missing data).

Unadjusted variables are defined as follows:

Sales to total assets = Sales (Compustat #12) / Total assets (Compustat #6). For banks, sales are measured as BankCompustat # 116.

Cost of sales margin = Cost of sales (Compustat #41) / Sales (Compustat #12), not calculated for banks.

Return on assets = Net income (Compustat #172) / Total assets (Compustat #6).

Return on equity = Net income (Compustat #172) / Common equity (Compustat #11).

Sales growth = $(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$.

Cost of sales margin growth = $(\text{Cost of sales margin}_t - \text{Cost of sales margin}_{t-1}) / \text{Cost of sales margin}_{t-1}$.

Net Income (Compustat #172) is in millions of dollars.

Inventory turnover = Cost of sales (Compustat #41) / Inventory (Compustat #3), not calculated for firms without inventory.

Accounts receivable turnover = Sales (Compustat #12) / Accounts receivable (Compustat #2).

Accounts payable turnover = Cost of sales (Compustat #41) / Accounts payable (Compustat #70).

Industry-adjusted variables are defined as the unadjusted variable (defined above) less the median calculated by year, across all firms in the Compustat database in the list firm's four-digit SIC code.

* Mean (or median) for list firms is significantly different than mean (or median) for control firms at $p = 0.05$ or better using a two-tailed student t-test (Wilcoxon signed-rank test).

† Mean (or median) is significantly different than zero in the predicted direction at $p = 0.05$ or better using a one-tailed student t-test (median test).

Table 5
Descriptive statistics for financial statement and market risk measures

	List firms^a unadjusted variables		Control firms^b unadjusted variables		List firms^a industry-adjusted variables	
	Mean	Median	Mean	Median	Mean	Median
Balance sheet measures						
Current ratio	1.612	1.409	1.853	1.483	-0.027	-0.104†
Debt to assets	0.222*	0.203*	0.226	0.213	-0.048†	0.029†
Altman Z-score	3.441*	2.830*	2.958	2.509	0.705†	0.063†
Variability of performance						
Std. dev. of sales	0.035*	0.020*	0.039	0.022	-0.007†	-0.010†
Std. dev. of net income	0.013	0.005*	0.013	0.008	-0.009†	-0.007†
Std. dev. of cash from operations	0.024	0.019	0.024	0.020	-0.008†	-0.007†
Market-based measures						
Stock price volatility	0.19*	0.15*	0.21	0.17	-0.01†	-0.03†

Notes to Table 5:

^a This column includes 582 firms on the *Most Admired* list for 2002-2004 with some firm-year observations leaving the sample due to missing data.

^b This column includes 552 control firm (matched on asset size and industry membership with 582 firms on the *Most Admired* list for 2002-2004 with some firm-year observations leaving the sample due to missing data).

Unadjusted variables are defined as follows:

Current ratio = Total current assets (Compustat #4) / Total current liabilities (Compustat #5).

Debt to assets = Total long-term debt (Compustat #9) / Total assets (Compustat #6).

Altman Z-score = $(1.2 \times X1) + (1.4 \times X2) + (3.3 \times X3) + (0.6 \times X4) + (0.999 \times X5)$.

X1 = [Total current assets (Compustat #4) – Total current liabilities (Compustat #5)] / Total assets (Compustat #6).

X2 = Retained earnings (Compustat #36) / Total assets (Compustat #6).

X3 = EarningsB4inttax / Total assets (Compustat #6), with EarningsB4inttax = Income before extraordinary items (Compustat #18) + Interest expense (Compustat #15).

X4 = [Price per share (Compustat #199) × Shares outstanding (Compustat #25)] / Total liabilities (Compustat #181).

X5 = Sales (Compustat #12) / Total assets (Compustat #6).

Std. dev. of sales = Sales (Quarterly_Compustat #2) / Total assets (Quarterly_Compustat #44).

Std. dev. of net income = Income before ext. (Quarterly_Compustat #8) / Total assets (Quarterly_Compustat #44).

Std. dev. of cash from operations = Net operating cash flow (Quarterly_Compustat #108) / Total assets (Quarterly_Compustat #44).

Stock price volatility = standard deviation of the natural logarithm of monthly CRSP price relatives (P_t/P_{t-1}) calculated over prior 24 months.

Industry-adjusted variables are defined as the unadjusted variable (defined above) less median measure for variable calculated by year, across all firms in the list firm's four-digit SIC code.

* Mean (or median) for list firms is significantly different than mean (or median) for control firms at $p = 0.05$ or better using a two-tailed student t-test (Wilcoxon signed-rank test).

† Mean (or median) is significantly different than zero in the predicted direction at $p = 0.05$ or better using a one-tailed student t-test (median test).

TABLE 6
Descriptive statistics for profitability, growth and efficiency measures
One quarter after firms appear on *Most Admired* list

	One quarter after appearing on Most Admired list
Profitability variables	
Sales to total assets	0.052 *
Cost of sales margin	-0.006
Return on assets	0.013*
Return on equity	0.036*
Growth variables	
Sales	0.214*
Cost of sales margin	-0.002**
Net income	0.536*
Efficiency variables	
Inventory turnover	0.131*
Acc. receivable turnover	-0.007
Acc. payable turnover	0.731*

Notes to Table 6:

All variables are industry-adjusted. Thus each variable is defined as the unadjusted variable (defined below) less the median calculated by year, across all firms in the Compustat database in the list firm's four-digit SIC code.
Sales to total assets = Sales (Compustat #12) / Total assets (Compustat #6). For banks, sales are measured as BankCompustat # 116.

Cost of sales margin = Cost of sales (Compustat #41) / Sales (Compustat #12), not calculated for banks.

Return on assets = Net income (Compustat #172) / Total assets (Compustat #6).

Return on equity = Net income (Compustat #172) / Common equity (Compustat #11).

Sales growth = $(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$.

Cost of sales margin growth = $(\text{Cost of sales margin}_t - \text{Cost of sales margin}_{t-1}) / \text{Cost of sales margin}_{t-1}$.

Net Income (Compustat #172) is in millions of dollars.

Inventory turnover = Cost of sales (Compustat #41) / Inventory (Compustat #3), not calculated for firms without inventory.

Accounts receivable turnover = Sales (Compustat #12) / Accounts receivable (Compustat #2).

Accounts payable turnover = Cost of sales (Compustat #41) / Accounts payable (Compustat #70).

* (**) Mean (or median) is significantly different than zero in the predicted direction at $p = 0.05$ (0.10) or better using median test.